

PSYCHOLOGY INFORMATION FOR STUDENTS

NO. 4 - SEPTEMBER 2005

1. The Use of the Adoption Study Method with Schizophrenia
2. An Introduction to the Social Construction of Aggression
3. Global Workspace Theory of Consciousness

ISSN: 1743-3851

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The Use of the Adoption Study Method with Schizophrenia

INTRODUCTION

One of the great debates throughout psychology is the role of genetics versus environment on causing behaviour. Though it is a combination of both factors, attempts are made to pinpoint the exact role of each. In particular, to establish the influence of genes, by controlling or trying to remove the environmental factors. This is done by the use of twin studies and adoption studies (Brewer 2002).

The logic for adoption studies is that if an adopted child develops a behaviour that their genetic parent(s) showed, but not the adopted parent(s), then that behaviour must be inherited.

A real experiment (1) would adopt children at birth, and place them in the opposite environment to their parents. This cannot happen because of ethical restrictions in psychology.

But adoption agencies use "selective placement", which tends to place the child for adoption with "suitable" parents: for example, better than average socio-economic security (Richardson 1994). However, adoption studies can still be useful in psychology generally (table 1).

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none">Shows influence of inheritanceMore ethical than equivalent experimentStudy over long period	<ul style="list-style-type: none">Age of adoption varies; ie: time spent with biological parentsSmall samples usuallyRetrospective dataReason for adoption of child; eg: difficult childEnvironment of adoptive families usually good

Table 1 - Main advantages and disadvantages of adoption studies.

The use of the adoption study, in the nature and nurture debate on the cause of schizophrenia, can be seen with the example of the Finnish Adoptive Family Study (2).

METHOD

The Finnish Adoptive Family Study looked at the Psychology Information for Students No.4; September 2005; ISSN: 1743-3851

medical records of 19 447 mothers hospitalised with schizophrenia in Finland between 1960 and 1979. Of these women, 263 had their offspring placed with adoptive families within the first four years of the child's life.

Ninety-four children were not included because they were adopted by relatives, adopted after the age of four years old, or adopted outside Finland. The final sample was 170 of the mothers (known as index cases) and 186 of their adopted offspring (known as index adoptees).

The offspring were matched ⁽³⁾ with 201 controls (adopted individuals of non-schizophrenic mothers). The matching process was based upon age, gender, time of adoption placement (ie: within six months), and socio-economic variables of adoptive family (eg: rural or urban).

Diagnosis of the biological mothers with schizophrenia was not assumed because the women were hospitalised, and the researchers diagnosed each case themselves ⁽⁴⁾. This involved two psychiatrists using DSM-IIIR ⁽⁵⁾ or Research Diagnostic Criteria on the hospital records if the mothers themselves could not be interviewed.

The children were interviewed in their homes (from 1977 onwards) in order to discover any psychiatric problems, and then re-interviewed by telephone 5-7 years and eleven years later ⁽⁶⁾.

FINDINGS

The first set of findings (Tienari et al 1987a) were reported based on 112 adoptees with a biological mother suffering from schizophrenia, and 135 control adoptees ⁽⁷⁾. Schizophrenia was diagnosed in 7% of the index adoptees and in 1.5% of the control group ⁽⁸⁾.

Then Tienari et al (1994) reported the findings (as at May 1992) on 155 mothers ⁽⁹⁾ and offspring, and 186 controls. Table 2 summarises the diagnoses of the offspring.

The researchers concluded that "there is a clearcut tendency for offspring of schizophrenics to have more schizophrenia, functional psychoses, and other serious psychiatric disorders" (Tienari et al 1994 p22). These findings are used to support the argument for the genetic basis to schizophrenia.

(% with)	ADOPTEES OF BIOLOGICAL MOTHERS WITH SCHIZOPHRENIA (INDEX ADOPTEES)	ADOPTEES OF BIOLOGICAL MOTHERS WITHOUT SCHIZOPHRENIA (CONTROLS)
no diagnosis of mental illness	51	57
schizophrenia (DSM-III-R)	5.2	0.5
schizopreniform disorder	1.3	0.0
delusional disorder	1.3	0.0
non-psychotic personality disorder	19.4	13.4
neurosis (10) or mild personality disorder	21.3	29.6

(After Tienari et al 1994)

Table 2 - Diagnosis of adopted individuals in Tienari et al (1994).

EVALUATION

Grace Jackson (2003) wrote an article questioning the Finnish Adoptive Family Study on three fronts - the conclusions, methodology, and theoretical issues.

1. Conclusions of the research

i) The rate of no diagnosis of mental illness was very similar between index adoptees and controls (51% vs 57%).

ii) Neurosis or mild personality disorders were more common among the controls (29.6%) than the index adoptees (21.3%).

iii) Only 5.2% of the index adoptees showed schizophrenic symptoms, which is a small number if the disorder is genetic. In other words, approximately 95% of offspring of biological mothers with schizophrenia did not have schizophrenia (11).

2. Methodological issues

i) The mental condition of the biological mothers of the controls. It was assumed that these women did not have schizophrenia because they were not hospitalised. The researchers relied upon the lack of diagnosis by others during the study period (1960-1979).

However, in Tienari et al (2000), it was revealed that 4.5% of the biological mothers of the controls had (mild) schizophrenia (12).

ii) There are limited details provided of the medical history of the index cases. Particularly whether there were any physical illnesses (eg: autoimmune conditions, head trauma) among these women that could have explained their mental illnesses.

iii) The timing of the adoption. Both the age of adoption (within the first four years of the child's life), and whether the mother manifested symptoms of schizophrenia before the adoption were important.

In order to establish a genetic basis to schizophrenia, any environmental variables that could influence the results must be controlled or isolated. Furthermore, the motivation of adoption for both groups was not explored in the research.

iv) No details were included about the presence of mental illness in the parent(s) of the schizophrenic mothers. If schizophrenia is inherited, then it can be seen in the genetic family tree across the generations.

Or the index cases may be suffering from schizophrenia caused by environmental reasons rather than genetic.

v) The process of adoption for the children can be stressful, and may be an environmental factor in mental illness. The median age of separation from the biological mothers (ie: put up for adoption) was thirteen months old, but some children were not actually adopted until four years old. What happened to the children during this period? Did contact with the biological parent(s) continue after the separation?

vi) Did the index adoptees come to know about their biological mother's mental illness? If so, there is the possibility of the self-fulfilling prophecy (Rosenthal and Jacobson 1968) (13).

3. Theoretical issues

The actual nature of the inheritance of mental illness is questioned here. There is no simple situation of a "gene for schizophrenia" (14), so how does the genetic inheritance actually happen (15)? Furthermore, the role of the environment in causing schizophrenia is underplayed:

The conclusions which Tienari draws from the Finnish adoption studies are concerning because

of their deterministic ramifications. Such determinism obviates society's responsibility to build non-toxic communities and rejects the individual's potential to exceed the destiny of normal or abnormal genes. The environment is rendered causatively neutral, while the individual is reproached for possessing or expressing defective DNA (Jackson 2003 p137) (16).

EVALUATIVE FOOTNOTES

1. A "true" experiment, rather than a "quasi-experimental" design will have a number of controls (Brewer 2002):

- i) The random assignment of the participants to the conditions (known as randomisation). However, it should be noted that "this procedure does not eliminate or even reduce individual differences but simply distributes those differences between the groups" (Davis 1995 p61).
- ii) Standardised procedures in all conditions, except for the independent variable.
- iii) Control over the variables in the experiment. In particular, the independent variable (controlled by the experimenter) can be clearly seen to lead to behaviour change (the dependent variable). Confounding variables should be eliminated if possible or compensated for. Otherwise confounding variables can render an experiment's results as untrustworthy; ie: it is not clear that the independent variable caused the dependent variable.

Adoption studies are quasi-experiments. Cook and Campbell (1979) defined quasi-experiments as "experiments that have treatments, outcome measures, and experimental units, but do not use random assignment to create the comparisons from which treatment-caused change is inferred".

Raulin and Graziano (1995) compared the experiment and the quasi-experiments (table 3).

EXPERIMENT	QUASI-EXPERIMENT
<ul style="list-style-type: none"> • States causal hypothesis • Manipulates independent variable • Randomisation of participants to conditions • Systematic procedures • Uses controls for establishing validity 	<ul style="list-style-type: none"> • States causal hypothesis • Independent variable not manipulated, but controlled • Cannot use randomisation • Specific procedures used • Uses some controls for establishing validity

Table 3 - Comparison of experiment and quasi-experiment.

2. Tienari et al (1987a; 1987b; 1994; 2000).

3. Matching is where participants are paired together based on similarity in relevant variable.

ADVANTAGE - Both groups are reasonably similar despite containing different individuals.

DISADVANTAGE - Difficult to match participants.

4. Rediagnosis of the participants by the researchers is a good way of standardising the diagnosis of the index cases.

5. DSM-IIIR = Diagnostic and Statistical Manual of Mental Disorders (3rd ed - revised) produced by the American Psychiatric Association (APA) in 1987 and lists all mental disorders with symptoms.

The key symptoms of schizophrenia are thought disturbances (eg: believing thoughts can be heard by others), auditory hallucinations, and primary delusions (holding beliefs despite obvious contrary evidence).

Generally schizophrenia is divided into "type I" (positive symptoms; eg: delusions) and "type II" (negative symptoms; eg: flatness of emotions) (Brewer 2001).

6. Age of onset of schizophrenia varies, and interviewing the participants on three occasions hoped to cover this fact. For example, "simple schizophrenia" develops gradually in late adolescence, while "hebephrenic schizophrenia" appears in the early 20s (Brewer 2001).

7. The number of participants is different from the original sample because of refusal by individuals to participate or the researchers losing contact with certain participants, if they moved, for example.

8. Breggin (1991) pointed out that where the adoptees had developed schizophrenia, it was often found that the adopted parent(s) were suffering from a mental disorder. So it could be due to the effect of the environment.

9. 136 mothers diagnosed as schizophrenia; 19 as schizophrenia spectrum disorder - schizoaffective, schizophreniform, atypical and delusional psychoses, but not bipolar and alcoholic psychoses.

10. Now classified as Anxiety Disorders in DSM-IV-TR (APA 2000).

11. Kety et al (1968) found a rate of 8.7% for the schizophrenic adoptees group. This is 13 of the 150 biological relatives: 7 were definite schizophrenia, 4 uncertain, and 2 inadequate personality. This compared to 1.7% for the control group (ie: 2 individuals).

This study used the detailed adoption records kept in the Danish Population Register, the researchers looked for children adopted young, who were born between 1924-47 in Copenhagen. There were 5483 child adopted by non-relatives in this period. They found 507 in this group who had been hospitalised with schizophrenia, and chose 33 to study.

A matched control group of 33 was also established. Then the researchers hunted for details of the biological relatives, and whether any of them had been diagnosed with schizophrenia (chronic, acute or borderline), uncertain schizophrenia or inadequate personality.

463 biological relatives of the 66 studied individuals were found and their names checked on the psychiatric registers. This study used only documents.

The Copenhagen study has been extended to the whole of Denmark (Kety et al 1994), and the sample rediagnosed by Kendler et al (1994) (table 4).

RELATIVES	FIRST DEGREE	SECOND DEGREE
ADOPTEES WITH SCHIZOPHRENIA	16/68 (23.5%)	14/141 (9.9%)
CONTROLS	5/107 (4.7%)	4/192 (2.1%)

(After Sham 1996)

Table 4 - Numbers of those diagnosed with schizophrenia.

12. This creates a problem because, in research, the control or comparison group should be the baseline by

which to compare the experimental or index group. The control group should not contain any biological mothers with schizophrenia, otherwise this is a confounding variable.

13. Self-fulfilling prophecy is the "idea that expectations about a person or group can become true simply because they have been stated" (Banyard and Grayson 2002). See Brewer (2004) in relation to experiments.

14. There is a lot of research currently to establish the key genes in schizophrenia, but the aim is to discover which genes for physical processes are involved; eg: DTNBPI (dysbindin) gene indirectly active in neurotransmitters (Levinson 2003).

15. Genes produce a phenotype (manifestation of behaviour based on genetic make-up and environment), and are viewed as dominant or recessive. Dominant genes require only one copy from either parent to manifest the behaviour (phenotype), while both copies are needed for recessive genes to show the behaviour (Brewer 2003).

There are a number of genetic mechanisms involved in inheritance of an illness (Craddock and Owen 1996):

i) Epistasis - the interaction of multiple genes to produce the illness;

ii) Locus heterogeneity - multiple genes are involved, but any one gene can produce the illness by itself;

iii) Allelic heterogeneity - a number of possible genes at one particular situation, and a certain combination produces the illness;

iv) Dynamic mutation - a particular gene mutates between parent and offspring;

v) Parent of origin effect - the expression of the gene depends upon the parent of origin; ie: a different effect between origin from the mother or from the father;

vi) Mitochondrial gene mutation - the illness is linked to the maternal pattern of inheritance

16. Other problems with adoption studies and schizophrenia include:

i) No assumptions can be made of equal environment between adoptees and controls, nor between adopted and biological family environments (Sham 1996);

ii) The sample of adoptees are not representative of the general population;

iii) Joseph (2000) was critical of the Oregon Adoption Study (Heston 1966): for example, "selective placement" of adoptees; diagnosis not made blindly; diagnosis of schizophrenia based only on "generally accepted standards"; and most adoptees spent time in "foundling homes" (children's homes).

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Article written September 2005

An Introduction to the Social Construction of Aggression

INTRODUCTION

Within social psychology the debate about aggression has revolved around its evolutionary benefits, and the social influences upon it. In other words, the belief that there are universal processes underlying aggression, but what is displayed or even experienced varies from culture to culture? And what if aggression was entirely a social product? This is a view argued by some social constructionists.

This idea is part of the "new paradigm" that has appeared in social psychology in the last few years which challenges all the traditional assumptions of scientific psychology. Even the assumption that aggression exists in a sense "out there" that can be studied.

New approaches have come to focus on the accounts that people give of their actions (ie: the meaning they attach to them), and their justifications for the behaviour within the constraints of "normality" and "acceptability".

The belief that the researcher has privileged access to the "real behaviour" is questioned, as is the neutrality of research. The researcher uses the same social processes (and biases) to interpret the research data as individuals in everyday life. The most important aspect of this process is language.

This has led to what some call a "crisis", which appeared more in social psychology, and revolved around two key issues (Hogg and Vaughan 1995):

- a) Psychology was predominantly reductionist with complex behaviour explained in terms of individual psychology;
- b) Psychology was predominantly positivistic ⁽¹⁾ with the experimental/scientific method as the dominant research method.

From the desire to look in new areas (ie: away from the main traditions of the lab-experimental approach) has come social constructionism.

Gergen (1994) showed that in its short history social constructionism has concentrated on three lines of inquiry:

- i) The construction of reality through language and discourse;

ii) The processes by which individuals come to understand the world;

iii) The development of accounts of human action based within a relational and social context.

Social constructionism can be seen as the movement from the search for "'psychological truth' to the social processes in which such truths are embedded and the relational functions that they serve" (Gergen 1994 p429).

"It argues that persons can only be properly understood in terms of their social practices and ways of thinking and being which constitute their particular society" (Stevens 1996 p30).

Social constructionism, though, is not really based on a fixed set of principles - it is "more properly considered as a continuously unfolding conversation in which various positions may be occupied, elaborated, or vacated as the dialogue proceeds" (Gergen 1994 p427).

Burr (1995) emphasised the "critical stance towards taken-for-granted knowledge" (p3), and the cultural and historical specificity of knowledge.

Brewer (2001a) summarised the main "principles" of social constructionism as:

a) The crucial importance of culture and social practices in the understanding of behaviour.

b) The transmission of culture and social practices through language. Language is not neutral but value laden, and there is need to focus on it as used in interactions (for example, through discourse analysis).

c) The research methodology chosen is different from the experiment because the experimental situation is itself a social construction not a social vacuum. It is better to accept the bias inherent in research and listen to the participants themselves. So we see the use of what is classed as "qualitative" methods of research.

d) Studying the individual cannot take place outside their social environment, even for behaviours like aggression, which may appear to be within the individual. It also makes reference to what some would see as sociological issues (eg: power in society).

Furthermore, any attempt to understand knowledge outside the cultural/social context is not possible - "there are only situated knowledges" (Stevens and Wetherell 1996).

The social constructionist approach has implications for our understanding of reality. Reality is socially constructed, not pre-existent, and it is also multiple.

There is no single "truth".

This is relativism. "Relativists, in general, are happy to live with the idea that their own claims to knowledge are constructed" (Wetherell and Still 1996 p112).

Social constructionism is different to other approaches because it is anti-essentialist. This means that it is against any "pre-given" content of the person (Burr 1995). So, for example, there is no such thing as aggressive personality traits existing within the person. Any observations of such traits are constructed from the social interaction that gives rise to that observation.

SOCIAL CONSTRUCTION OF AGGRESSION

Defining aggression has always been difficult. One distinction, though, is often made between hostile and instrumental aggression. The latter being the use of aggression as a means to an end (eg: for self defence in an unprovoked attack). This is often not seen as aggression, because to call a behaviour "aggressive" is to give it a negative evaluation.

What is being said is that aggression is an "interpretative construct" rather than just a descriptive term (Mummendey 1996). For example, the police intervening at a demonstration will be perceived differently depending on which side the observer supports.

More specifically in the speeches of George Bush about the "war against terrorism" since 11th September 2001, he emphasised the justifiable nature of the US military reaction. Even when civilians are killed, it is seen as an unfortunate accident (not as aggression against the innocent). Yet those who support the attacks on 11th September believe that their acts are justified and are not aggression, but self defence or retaliation against Western capitalist imperialism.

Language as always is the key, and aggression is in the eye of the beholder:

The genocidal wars of Cambodia, Rwanda and Croatia are littered with language of honour, right and just cause. Ethnic cleansing makes mass murder sound almost clinical and reasonable (Cardwell and Humphreys 1998 p5).

The search is for what factors influence the interpretation of a behaviour as aggressive or not. Mummendey (1996) lists three factors:

1. The specific norms of the situation, and whether the behaviour violates them.

Within the construction of traditional masculinity in the West, an aggressive response is seen as "normal" in certain situations. To not do so would be "unmanly". Canaan (1996) showed how young working-class males are always reaffirming their "hardness" with verbal and physical aggression. This varies from the "banter" at work to fights after the pub closes:

Informal shopfloor interaction between men manual workers is often highly aggressive, sexist, and derogatory, humourous yet insulting, playful but degrading...Those who display a willingness to 'give it and take it' are accepted into the masculine sub-culture, while those who 'snap' have failed this particular test of manhood.. (Collinson and Hearn 1996 p68).

This is not aggression for the men involved - it is a "normal" part of "being a man".

Similarly, Reilly et al (2004) looked at violence and masculinity among young men in Northern Ireland. Using focus groups, this research explored explanations and attitudes to violence. The "normality" of violence for young men can be seen in extracts from the transcripts of the focus groups:

- "Violence is a natural reaction. If someone runs up behind ye, yer (sic) first instinct is to put your fists up" (young Catholic male);
- "If it's just one on one, it's different to if there was an audience there, and like you were almost like humiliated, then you'd have to do something" (young Protestant male);
- "If you have a disagreement with someone, you wouldn't argue with them, you'd just hit them. Whereas women are more bitchy and they would go on and on arguing for ages" (young offender);
- "People will think you're a 'poof' if you try to talk your way out or something" (young Catholic male);
- "You don't want to be seen to be ..weak, like if you are you're likely to get done over the next time, be walked over by others" (young Protestant male).

These extracts show the "inevitability of experience of violence for young men. There was explicit reference made to a set of expectations that held that young men should behave violently" (Reilly et al 2004 p474).

Thus violence is an expected response for men: for example, the 1991 riots in England as a masculine

response to unemployment and economic crisis (Campbell 1993). Violence as part of masculine identity is part of "doing gender"; ie: accomplishing and maintaining a gender identity (Frosh et al 2003).

2. The attribution of cause of the behaviour as situational or dispositional.

Rule and Ferguson (1984) talked about the "is-ought" discrepancy (the discrepancy between what actually happened and what should have happened). If an individual is badly insulted and provoked, their reaction with a punch will be perceived and labelled differently to an unprovoked punch.

Widdicombe and Wooffitt (1995) interviewed "punks" who were involved in fights with the police after a concert. One interviewee, MR, portrayed the violence as an ordinary reaction to the provocation of the police:

..(W)e go outside and there they are fucking eight hundred old bill just waiting for the chance, riot shields, truncheons and you're not doing nothing, you're only trying to get down to the tube and go home, so what do they do? You're walking by and they're pushing you with truncheons and they start hating (sic) the odd punk here and there and what happens? The punks rebe-rebel (sic), they don't want to get hit in the face with a truncheon. Nobody does. So what do you do - push your copper back and then what happens? Ten or twelve of them are beating the pure hell out of some poor bastard who's only tried to keep somebody off his back. Now that started a riot (Jorgenson and Phillips 2002 p131).

Add to the attribution of cause, the assessment of responsibility, and research shows that people become angry when they feel they are victims of deliberate or unjustified acts. The justification of behaviour is a key area of interest to social constructionists, particularly the feeling of "being in the right".

For example, Reilly et al (2004) found that young men in Northern Ireland saw police behaviour ("like a red rag to a bull like"; sic) the cause of much violence. A young Protestant male felt that the police were "there just to get you out of the road, or to beat you out of the road, one of the two".

3. The position of the individual as actor, recipient or observer.

The use of aggression can be seen as a form of coercive power. Particularly whether a behaviour is

legitimate or illegitimate will affect whether it is labelled as aggressive.

Tedeschi and Felson (1994) list the factors influencing whether individuals choose to use aggression as coercive power - expectancy in achieving goals with aggression; value attached to the goal; and the utilities and costs of behavioural alternatives. Thus the use of force to remove an invading army can be seen as legitimate, and not defined as aggression. Yet the behaviour of the invaders would be defined as aggression.

Wetherell and Potter (1989) took the example of police activity during protests and fighting at the 1981 rugby matches in New Zealand when South Africa were the tourists. They interviewed white New Zealanders who were spectators. Using discourse analysis of the interviews, they showed how the police actions were "constructed" ("defined") as aggressive or not.

The interviews can be divided into groups based on the justification given for the police violence:

- i) The police were antagonised by the protesters, and thus the police behaviour was not seen as violence. Any reports of such violence are downgraded by "minimization of the injury" (Semin and Manstead 1983);
- ii) The police action is seen as a response to earlier violence, and is necessary in the situation;
- iii) This group accepts the police were violent, but that it was necessary (justified) to keep law and order;
- iv) The police behaviour is viewed as a consequence of the situation - eg: "tempers wore thin";
- v) The police are seen as only doing their job.

Not all the speakers were direct supporters of the police, but were trying to make sense of the situation. The construction of behaviour as caused by "outside forces" is influenced by, and part of the language used, and consequently the definition of aggression. Aggression is usually seen as negative, and "caused" by the particular individual. Other behaviour (that which is not seen as aggressive) is "caused" by the situation, and usually seen as justified.

CONCLUSIONS

From a social constructionist understanding of aggressive behaviour, there are no such thing as objective acts of aggression. It is more interesting to

see what behaviour is labelled aggression and which is not. The key factors here are:

- i) The role of language; eg: "terrorist" or "freedom fighter";
- ii) The justification of behaviour as "legitimate" or "normal";
- iii) The context of aggression within social structures (like masculinity).

It is always important to be aware of the social structures for social constructionists. For example, Western society today is a particular form of capitalism ("consumer capitalism"; Brewer 2001b), and this encourages aspects of aggression as the "normal" way of life; eg: "the killer instinct" is encouraged in sport, or ruthless ambitious in the business world.

FOOTNOTE

1. Positivism is where "social relations are to be regarded as 'facts', 'things' to be investigated in an objective manner" (Sciarra 1999).

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Article written May 2002 and September 2005

Global Workspace Theory of Consciousness

INTRODUCTION

Dennett (1991) called consciousness the "last surviving mystery" because "we are still in a terrible muddle" about it.

Many attempts have been made to develop theories of consciousness, to describe and explain what it is (or is not). Attempts to understand how it works, and how consciousness and the unconscious relate together (1).

The Global Workspace Theory (GWT) (Baars 1988; 2002) is a recent theory in the computational model (or cognitive) tradition. This means that the brain and what is happening within can be modelled in computer terminology and concepts.

GWT ASSUMPTIONS

The GWT makes a number of assumptions about the brain (Baars et al 2003):

- i) The brain is "a collection of distributed specialised networks", including perception, attention, and memory. These networks include (Braisby 2002):
 - a) Specialised input processors - parts of the brain that process particular information non-consciously eg visual stimuli. These processors are efficient in their limited domain only, and are parallel processors;
 - b) Specialised receiving processors - parts of the brain that receive information from the global workspace.

ii) Potentially conscious brain activities compete (2) for access to the global workspace. In other words, the most important activities of the moment will reach this global workspace (and become conscious) because the global workspace has a limited capacity (3).

iii) The brain contains "contexts" ("unconscious networks") which shape the conscious experience. For example, aspects of visual perception will be unconscious, but their participation leads to conscious visual perception (ie: what we actually see).

"Contexts" also include learning, particularly in relation to problem-solving.

iv) Intentions and emotions can be "goal contexts" which motivate conscious experience without necessarily being conscious themselves.

v) The global workspace (a process rather than a structure) takes place in the prefrontal cortex of the brain.

GWT

Baars et al (2003) talked about the metaphor of "the theatre of the mind" and the global workspace as the spotlight on stage. While behind the scenes, "an invisible (unconscious) director and playwright try to exercise executive control over the actor and the spotlight" (p672).

Using another metaphor, the global workspace can be likened to a message board on an internet site (Braisby 2002).

There are links here to the models of selective attention where only certain stimuli can be consciously attended because of limited channels (eg: Broadbent 1958) or limited capacity (eg: Kahneman 1973).

It is important to emphasise that this theory, like many current ones, is against the idea of a central place ("a Cartesian theatre" (4)) where consciousness lives and is controlled. The idea that there is a little person ("homunculus" (5)) inside the head who controls the whole brain is not accepted (Dennett 1991).

The GWT, like many theories in cognitive neuropsychology, makes use of brain-injured patients as evidence. In these cases, through injury or illness, part of the brain has been "turned off", and the effect of this can be observed.

One such example is the condition of visual neglect, which is "a failure to attend to or even perceive certain aspects of the environment" (Braisby 2002 p180).

This is not due to visual problems, but the information about one side of the environment, for example in unilateral visual neglect, does not reach conscious awareness.

According to the GWT, specialised input processors for that information are not competing to gain access to the global workspace for some reason. In fact, the visual neglect is now a "context" (Baars et al 2003).

FOOTNOTES

1. Other cognitive theories include the Information

Processing Theory of Consciousness (Shallice 1988) or the Multiple Drafts model (Dennett 1991).

2. The idea of brain cells, areas or networks competing to "gain attention" is popular in a number of recent theories (Blackmore 2002).
3. The existence of different levels or types of consciousness is also popular in recent theories (eg: Halligan and Oakley 2000).
4. Descartes, in the seventeenth century, believed that the brain had a centre, which he said was the pineal gland. This latter idea is now completely discounted. The view of the brain having a centre is known as the Cartesian theatre.
5. Early theories of the brain believed that a "little man" (homunculus) sat inside and controlled everything that happened.

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Article written September 2005

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ISSN: 1743-3851

Published twice per year: March/September

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